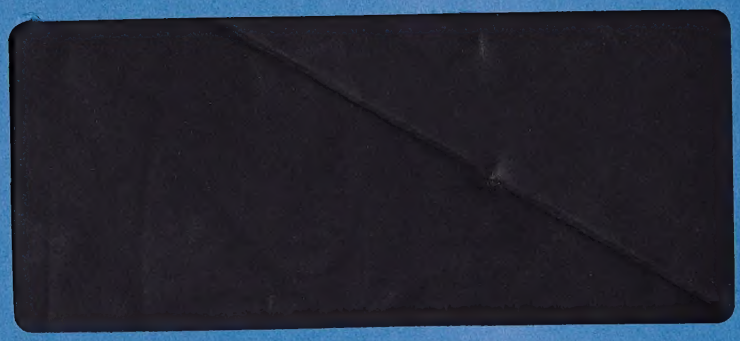
A.M. GOAS

TECHNICAL BULLETINS

FAIRCHILD
ELECTRO-METRICS
CORPORATION



TECHNICAL BULLETINS

INDEX OF BULLETINS

NUMBER	DATE	SUBJECT
7	6/13/66	Procedure for Adjusting Metering Circuitry of Models EMC-10 and EMC-10E Analyzer
11	7/28/66	Remote Antenna Band Switching for EMC-25R
12A	7/28/66	Interference Analyzer Model EMC-10
15	5/04/67	Definitions for RFI/EMC Terms
16	10/26/67	Auxilliary Items Provided with Electro-Scan Programmer Model ESC-125A
17	10/30/67	Auxilliary Items Provided with FSS-250 and FSS-250D
18	10/30/67	Auxilliary Items Provided with Spectrum Display Module Model SPD-125
19	12-11-67	EMC-25 Inspection Test
21 Mods + Repairs	12/21/67	Frequency Adjustment on EMC-25, EMC-25R
22 Eval = Approv	1-3-68	FSS-250 check-out Procedure Incoming Inspection level
23	1/08/68	I. G. Modification
24	1/19/68	Cost Saving with Model FSS-250
25 Mods + Repairs	2/13/68	Field Adjustments of Sweep Board A3P9 of EMC-10E
26 Mods + Repairs	2/06/68	Connector Wiring for Cable from Model ESC-125A Programmer to X-Y Plotter
27 Applications	2-12-68	Broadband (Impulse) Sensitivity
28A Mods + Repairs	7/08/68	Making Connections to CJB-25
29	3/27/68	Additional Data on Installing PP-125 in DuMont Oscilloscopes
30 Mods + Repairs	4/11/68	Procedure for Installing Impulse Generator in EMC-25
31 Applications	4/18/68	Calibrating EMC-25 with Strong Input Signal
32 Mods + Repairs	4/24/68	Procedure for Removing Front Panel from EMC-25
33	5/13/68	Test Procedure RVA-25
34 Applications	5/22/68	Multi-Band Graphs
35A Applications	10/30/68	Operating Instructions Calibrator Level Control Model CLC-25
36A Applications	2/24/69	True Antenna Factor for Log Conical Antenna Model LCA-25
37A Applications	8/21/68	Antenna-Induced Voltage for EMC-25 41" Rod Antenna
38 Mods + Repairs	7/17/68	Audio Improvements for EMC-25

NUMBER	DATE	SUBJECT
39 Mods & Repairs	7/24/68	Field Realignment of EMC-10E After Regulator Board Replacement
40 Mods & Repairs	7/24/68	Additional Information for Programmer Model ESC-125A
41 Mods & Repairs	8/01/68	Locating EMC-10 Alignment Procedures
42	10/22/68	I. G. Output on Front Panel of EMC-25
43A Eval & Approv	11/06/68	FSS-250 Inspection Test
44	11/27/68	Magnetic Field Conversion Table
45 APPLICATIONS	2/19/69	Protection of CAL Level Control on ESC-125A Programmer
46	2/24/69	Typical Tuned Dipole Induced Factor for BDA-25 and LCA-25
47 Mods & Repairs	3-17-69	Procedure for Balancing Tuning Voltages and Adjusting Scan rate of EMC-10A
48A	3/26/69	Removal and Replacement Procedure for Video Detector #2-EMC-25
49A	3/26/69	Modification of Log Detector-EMC-25
51	6/03/70	Extended Frequency Range of EMC-10 in FSS-250 System

BULLETIN #7

June 13, 1966

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

Procedure for Adjusting Metering Circuitry of Models EMC-10 and EMC-10E Analyzers

1. Set controls as follows:

   GAIN control ---------- clockwise

   Detector function ---------- CARRIER

   BANDWIDTH control ---------- WIDE BAND

   W.B. RANGE control ---------- 100 MV

   N.B. RANGE control ---------- 100 MV

   FILTER control ---------- 500 KC

   IMPEDANCE switch ---------- 50 ohms

2. Apply a 20 KC, 100 MV signal to the input connector.

3. Adjust the level of the external source to obtain 75 MV at the input to the Log Amplifier (pin 10, A3J5). Use a 10 M ohm impedance 50 pf (or less) audio VTVM.

4. Decrease input signal by 20 DB.

5. Adjust R25 on A3P6 to obtain a -20 DB reading on meter scale.

6. Increase input signal level 20 DB and adjust R19 on A3P6 for full scale deflection.

7. Repeat steps 4 through 6 to obtain meter readings to within 1 DB linearity.

8. Decrease input signal by 30 DB.

9. Adjust signal level for -30 DB reading on meter scale.

10. Repeat steps 4 through 9 to achieve agreement.

11. Decrease input signal by 40 DB.

12. Adjust A4P4-R16 to obtain a -40 DB reading on meter scale.

13. Repeat steps 4 through 12 to obtain best linearity.

14. A. Adjust input signal to read -10 DB on the meter. With Detector Function at + Peak Adjust A4P4-R17 for +3 DB reading above Carrier Reference reading.

    B. Set detector function to -Peak and note meter reading. If the + and - Peak readings do not agree, adjust A3P6-R16 to equate the two. Recheck meter linearity and repeat steps 1 through 12 if necessary.

15. Set input signal level to 50 MV. Adjust gain of Wide band amplifier (A3P4-R11) to obtain full scale meter deflection.

16. Change BANDWIDTH control to 50 CPS and tune the instrument to peak response at the frequency of the incoming signal.

17. Adjust gain of 2nd IF amplifier (A3P3-R16) to obtain full scale meter deflection.

Bulletin #11

July 28, 1966

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

Remote Antenna Band Switching for EMC-25(R) Interconnection Tabulation Including Wire Required for Operation at 200 feet

Circuit Function	Antenna Connector MS-3106B20-16S (Pin No.)		EMC-25 Conn. Winchester Elec. SRE-34 PJTCH (Pin No.)	Wire Size
Ground	A	connect to:	CC	#18
0001 Switching Logic	B	connect to:	F	#18
0010 Switching Logic	C	connect to:	J	#18
0100 Switching Logic	D	connect to:	E	#18
1000 Switching Logic	E	connect to:	H	#18
Logic Common	F	connect to:	M	#18
-Raw Voltage	H	connect to:	NN	#16
+Raw Voltage	I	connect to:	KK	#16
Shield	Connector Shell	connect to:	Connector Shell	Shield.

USE AND CARE OF

INTERFERENCE ANALYZER MODEL EMC-10

Bulletin #12A

July 28, 1966

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

NOTICE

This instrument contains a Nickel-Cadmium battery which, when fully charged, can power the instrument without connection to an external AC or DC supply for up to 8 hours. It will fully recharge after such usage in 16 hours.

Because most testing with this instrument is likely to be performed sporatically for shorter periods of time, it is usually difficult to know the charge condition of the battery. While the front panel Battery Test Switch indicates relative charge condition of the battery, it neither indicates exact degree of charge or balance condition of the battery or of voltage to the instrument.

Inability to calibrate this instrument, in amplitude and/or frequency, may also be an indication of low battery charge, and/or improper voltage balance.

SUGGESTION

For most efficient operation keep this instrument connected to a live outlet, whether turned OFF or ON, as the normal condition of usage, and keep it on charge even when in storage. It cannot be overcharged!

Use the battery when you want to be fully disconnected from the power line, when in the field, or at other appropriate times. But normally keep it on AC and as near full charge at all times as possible for best overall operation.

SERVICE HINT

Should any apparent performance problem arise such as seeming inability to calibrate the instrument for amplitude or frequency, proceed as follows:

(1) Turn off instrument, connect to live AC source, and leave on charge for 24 hours.

(2) If the instrument still does not perform properly or cannot be calibrated, contact your local representative or the factory directly as to further steps to take.

OPENING UP THIS INSTRUMENT AND MAKING ADJUSTMENTS WITHOUT FAIRCHILD APPROVAL WILL NULLIFY THE WARRANTY.

You should have many years of trouble-free use of this instrument. Since, however, experience has shown that the greatest cause for operating difficulty has been inadequately charged battery, we have provided you with these operating suggestions in hopes they will be helpful in the unlikely event a mal-function should occur.

BULLETIN #15

May 4, 1967

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

DEFINITIONS FOR RFI/EMC TERMS

Ambient Electromagnetic Environment: Ambient Electromagnetic Environment is that electromagnetic level existing in any area and emanating from sources other than the test specimen.

Antenna Conducted Interference: Antenna Conducted Interference is any signal generated within a receiver or transmitter and appearing at the antenna terminals as an undesired signal. Examples are the second harmonic of a transmitter signal or the local oscillator signal of a receiver.

Antenna Counterpoise: Antenna Counterpoise, when used, provides a ground reference plane for the antenna.

Antenna Factor: An interference analyzer as a two-terminal device is calibrated in dBuV (dB above one microvolt across the input terminals) or dBMHz (dB above one microvolt per megahertz across the input terminals.) When used with a calibrated antenna, the Antenna Factor in dB is added to the two-terminal reading to provide either: (a) The induced antenna open-circuit voltage expressed as dBuV or dBMHz; or (b) The electric field strength in microvolts per meter (dBuV/m) or microvolts per megahertz per meter (dBMHz/m).

Antenna Induced Microvolts: Antenna Induced Microvolts is that voltage which is calculated to exist across the open-circuited antenna terminals.

Bonding: Those practices used to connect electrically all ground wires, cable sheaths, etc. to ensure they are as close to being at the same potential as possible.

Broadband Interference: Broadband Interference is defined as an interference signal with a bandwidth wider than the bandwidth of the measurement equipment in use.

Conducted Interference: Conducted Interference is the interference being conducted from one point to another by way of power cords, signal lines, etc. It is measured in terms of voltage between two conductors or one conductor and ground. It is also measured in terms of the interference current flowing in a conductor.

(over)

dB above 1.0 microvolt per megahertz: The unit of measurement of broadband impulsive electromagnetic interference is in terms of microvolts per megahertz. This term is equal to the number of root-mean-square sine wave microvolts applied to the input of the measuring circuit at its center frequency that will result in a detector peak response in the circuit equal to that resulting from the interference pulse being measured, divided by the impulse bandwidth of the circuit in megahertz. dBMHz is a decibel form of the unit, i.e. dB above one microvolt per megahertz.

Forty-one inch Rod Antenna: A Forty-one inch Rod Antenna, (1 meter equivalent) is a standard length antenna used for field strength measurements. This antenna is loaded and matched to the associated receiving or transmitting equipment.

Ground: A reference plane common to all electronic, electrical, electromechanical systems and connected to earth by means of a ground well, ground grid, or other similar means.

IF Frequency: The center frequency to which incoming signals are heterodyned. Most of the gain and bandwidth control, are achieved at I.F. frequency.

Image Frequency: In a superheterodyne converter, two signal frequencies will produce an IF frequency. One if the primary or desired response, the other an undesired image. In a normal difference heterodyne process (I.F. = (LO). - Fs). The image is spaced from the primary response by 2 times I.F. frequency.

Image Rejection: Image Rejection is the relative sensitivity between the response at the signal frequency to the response at the image.

Impulse Bandwidth: The Impulse Bandwidth is the area divided by the height of the voltage response versus radio frequency selectivity curve from the antenna through the peak detector. Impulse Bandwidth is approximately the equivalent to the 6 dB bandwidth points of the selectivity curve.

Impulse Generator: An Impulse Generator is a device which generates a very wide spectrum of energy by means of a very narrow impulse. The impulse is generated by charge and discharge of a short coaxial or waveguide transmission line. The impulses are non-overlapping and regularly spaced. The impulse repetition rate is sometimes variable from a few per second to a few thousand per second. The output is specified in dBMHz.

Impulse Interference: All broadband interference, including random noise and pulse CW, is considered to be impulsive interference for purposes of standardization

Interference: Interference is defined as any electromagnetic phenomenon, signal or emission, man-made or natural, which causes or can cause an undesired response, malfunctioning or degradation of performance of electrical or electronic equipment.

Internal Noise Level: Internal Noise Level is the receiver noise available at the detector of the Interference Analyzer. An indication of this level is obtained on the measuring equipment meter with no input device connected.

Local Oscillator: The Local Oscillator operates at some fixed frequency (above or below the incoming signal) which differs from the incoming signal by the intermediate frequency. The Local Oscillator tuned circuit is "ganged" with the preselector tuned circuit; as the receiver is tuned over its range, the preselector and oscillator frequencies always differ by the intermediate frequency.

Minimum Discernible Signal (MDS): MDS is a measure of the sensitivity of Interference Analyzer. It is generally specified as the signal level required to give a rise in output, above set noise, of 1.0 dB, and sometimes less. Electro-Metrics uses Tangential Sensitivity, a more conservative measurement.

Mixer: A Mixer is a nonlinear device which, when fed the signal f_1 from the preselector and the voltage f_2 from the local oscillator produces a number of new and different frequencies in its output. These include, besides f_2 and f_1, $2\ f_2$, $2\ f_1$, $(f_2 + f_1)$ and the desired intermediate frequency $(f_2 - f_1)$ which retains the modulation originally impressed on the RF carrier.

Narrow Band Interference: Narrow Band Interference is sharply tunable, and has a spectrum that occupies a small part of the bandwidth of a receiver. Unmodulated and amplitude modulated sine wave carriers are typical examples.

Octave: An Octave is a frequency ratio of 2 to 1. For example: 1 to 2, 2 to 4, or 500 to 1000 megahertz.

Open Space: Open Space is intended to designate an ideal site for radiated interference measurements. This ideal site should be open, flat terrain, at a considerable distance from buildings, electrical power lines, fences, trees, and underground cables. This site should have a sufficiently low ambient level of radiated interference and signals to permit testing of radiated interference limits at any test frequency selected. Since such ideal locations are rare, a site as close to the ideal as practical, should be selected.

Pick-up Device: A Pick-up Device is used to couple energy into the antenna terminals of a receiver. Such devices are antennas, current probes and line probes.

Post IF: An IF pick-off from the receiver taken at the output of the IF section. This provides maximum signal level but at a restricted bandwidth.

Pre IF: An IF pick-off from the receiver taken at the beginning of the IF section. This provides maximum bandwidth at a low signal level.

Preselector: The preselector is usually a variable-frequency tuned circuit, sometimes employing amplification, which is tuned to the frequency of the desired signal. The preselector passes the desired signal to the mixer but rejects or discriminates against received signals of other frequencies.

Pulsed CW: Pulsed CW is a narrow band carrier modulation by one of several types of pulse trains. This type of interference has a spectrum but can have the characteristics of either narrow band or broadband interference depending on pulse shape, repetition rate and the bandwidth of the measurement equipment.

Radiated: The term Radiated implies only that no hard connection existed between the test specimen and the Interference Analyzer.

Random Noise: Random Noise is characterized by random amplitude, frequencies, and phases.

Receiver Front-End Rejection: Front-End Rejection is the measured capability of a receiver, expressed in decibels, to reject signals at the antenna terminals that are outside the channel to which the receiver is tuned.

Sensitivity: The signal level required to produce a discernible output from a receiver. The signal level is usually expressed in dBM for a (Signal plus noise) to (noise) ratio of 3 dB.

Slide-back Circuit: To obtain a true peak reading, use is made of the Slide-back Circuit technique. Such a circuit consists of an adjustable bias on the audio detector diode which blocks signals whic produce voltages less than that required to overcome the bias. The procedure is to adjust the bias manually until the output indications just disappear, using the highest possible gain of the audio stages. At this point, the bias is just equal to the peak value of the applied signal.

Spectrum Analyzer: A scanning receiver which automatically tunes through a selected spectrum and displays on a CRT or chart, a plot of level versus frequency of signals at its input.

Spurious Response: The Spurious Response is the sensitivity of a receiver to signals whose frequencies are other than that frequency to which the receiver is tuned.

Substitution Technique: This term describes a method of measuring interference. The method depends upon availability of a calibrated signal source, the output of which is similar to that of the unknown signal, that is, an impulse generator for broadband measurements and a sine wave generator for narrowband measurements. The general m

is to obtain any convenient reference reading with the unknown connected and then to connect the calibrated source. The source is then adjusted for the same reference reading.

Superheterodyne Receiver: A Superheterodyne Receiver employs the fundamental concept of changing the received RF signal to some intermediate frequency (IF) before final detection and retrieval of the modulation. The fundamental elements of a basic superheterodyne receiver are a preselector, local oscillator, mixer , intermediate frequency amplifier, detector and output circuits.

Suppression: Suppression is the reduction of radiated or conducted electromagnetic interference by such means as circuit changes, filtering, shielding etc.

Susceptibility: Susceptibility is defined as that characteristic which causes an equipment to malfunction or exhibit an undesirable response when its case, external leads or circuit, excluding antennas, is subjected to electromagnetic voltage or fields.

Bulletin # 16

AUXILLIARY ITEMS PROVIDED
WITH ELECTRO-SCAN PROGRAMMER
MODEL ESC-125A

October 26, 1967

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

All of the following items will be provided to make up the complete package on shipment of an Electro-Scan Programmer Model ESC-125A:

(1) Electro-Scan Programmer Model ESC-125A
(2) AC Power Line Cord Model PCD-25
(3) Antenna Switching Unit Model SU-125
(4) 18 each patch cords, 1471-3-03-10 for SU-125
(5) Control cables from ESC-125A to EMC-25R Model CEE-25, 4657
(6) 1 each Control Cable from ESC-125A to EMC-10, Model CEE-10,4656
(7) 1 each Control Cable from ESC-125A to SU-125, Dr.4660
(8) 2 each Coax Cable, 25-ft., TNC Connectors, Model CAC-25
(9) 1 each Coax Cable, 25-ft., TNC-BNC, Model CAB-15
(10) 1 each 50 pindummy plug for ESC-125A per Dwg. 4650.
(11) 1 each Extender Board for ESC-125A Model EXB-125
(12) 1 each large positive multi-band paper for X-Y Plotter
(13) 1 each small positive for multi-band paper for X-Y Plotter
(14) 25 each small sheets multi-band paper for X-Y plotter
(15) 1 each instruction manual

Technical Bulletin #17

AUXILIARY ITEMS PROVIDED
WITH FSS-250 and FSS-250D

October 30, 1967

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

All the following items will be provided to make up the complete package on shipment of a Spectrum Surveillance System Model FSS-250 or FSS-250D:

3 each Coaxial Cable CAC-25 (4649-1)
1 each Earphones EHF-25
1 each EMC-25 Alignment tools
1 each EMC-25 Dummy Plug
1 each EMC-10 Extender Board ECB-10A
1 each EMC-10 Extender Board ECB-10B
1 each XYC-10 X-Y Plotter Interconnecting Cable
1 each EMC-10 Dummy Plug
1 each SU-125 Antenna Switching Unit
1 each Line Cord (System)
1 each SU-125 Control Cable (4660-1)
1 each ESC-125A Extender Board
1 each ESC-125A Dummy Plug (4650)
1 each SPD-125 Extender Board
1 each PDC-25 AC Power Cord
1 each CJB-25 Control Junction Box
1 each EMC-25 Calibration Curves
1 each PCD-10 AC Power Cable
1 each PEC-10 Power Extension Cable
1 each EMC-25R Extension Cable M-F (4666-1)
1 each EMC-10 Extension Cable M-F (4667-1)
1 each TNC-BNC Coaxial Cable
1 each Cleaning Kit for EXY-125A or EXY-250
1 Supply of Pens and ink for EXY-125A (comes with plotter)
1 Large Positive Multi-band Paper.
25 Small sheets Single-band paper.
1 Small Positive for Multi-band paper.
1 Small Positive for Single-band paper.
50 Small Multi paper
50 Large Multi paper
4 Feet for EMC-25
4 Feet for EMC-10
4 Feet for SPD-125
4 Feet for ESC-125A
1 Plotter Arm Hold-down (Installed)
1 Certificate of Conformance for: EMC-25, EMC-10, SPD-125, ESC-125A EXY-125 and FSS-250
1 Instruction Manual for: EMC-25, EMC-10, EXY-125A, ESC-125A, SPD-125 and FSS-250

Bulletin #18

AUXILIARY ITEMS PROVIDED
WITH SPECTRUM DISPLAY MODULE
MODEL SPD-125

October 30, 1967

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

All of the following items will be provided to make up the complete package on shipment of a Spectrum Display Module Model SPD-125:

(1) Spectrum Display Module Model SPD-125.

(2) AC Power Line Cord, bayonet type.

(3) 1 each Control Cable from SPD-125 to EMC-25(R), Model CEE-25, 4657

(4) 1 each Coax Cable, post-IF, BNC Connectors, 4648-2

(5) 1 each Coax Cable, AM Video, BNC Connectors, 4647-2

(6) 1 each Green Filter

(7) 1 each Extender Board for PP-125, Model EXS-125

(8) 1 each Instruction Manual

FREQUENCY ADJUSTMENT
ON EMC-25, EMC-25R

December 21, 1967

Bulletin #21

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

ALIGNMENT OF TUNING VOLTAGE - EMC-25

1. Put unit in Band #1 position
2. Set main tuning dial to low freq. end of band (Full CCW).
3. Set fine tune control midway.
4. Connect voltmeter between terminal #13 on A5TB1 (yellow wire) and ground.
5. Adjustments are on printed board behind unit meter. The pot nearest side of unit is for hi end adjustment (+101 volts DC). The center pot is for sweep voltage (+101 VDC.) The inside pot is for +0.4 VDC (Lo end).
6. Adj. inside pot for +0.4 VDC.
7. Set main tune dial to max. CW position and adj. outside pot for +101 VDC.
8. Repeat steps until alignment is no longer necessary.
9. Put MAN-AFC-SWP switch to sweep position.
10. Adjust center pot for +101 VDC.
11. Check freq. accuracy on lo and hi end of some bands in orange region of scale.
12. Readjust voltage for freq. IF necessary.

I.G. MODIFICATION

January 8, 1968

Bulletin #23

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

1. Remove brown wire completely.

2. Remove violet from top of IG and install on board where brown wire was.

3. Remove blue/white wire on cylindrical scale switch which comes from HH on front panel plug. Install about 2 inches of black #26 wire where blue/white was connected. Install ground lug on scale bracket screw nearest to switch connection. Connect black wire to lug.

4. Connect blue/white to violet wire on cylindrical scale switch terminal #7 on S1C.

5. Remove jumper between HH and CC on dummy plug and install jumper between HH and Y.

COST SAVING WITH MODEL FSS-250

January 19, 1968

Bulletin #24

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

It is obvious to potential users of the FSS-250 that it will result in a significant reduction in cost of RFI/EMC testing over using manual point-by-point data acquisition. The amount of saving increases rapidly with the number of spectrum scans required, a spectrum scan being defined as the collection of a single complete set of data for the 14 kHz - 1000 MHz range. When coverage down to 20 Hz is required, savings are even greater.

As the tabulation (back) shows, 70 spectrum scans/year on the FSS-250 X-Y plotter is the break-even rate. Although use of the FSS-250 to collect these 70 scans on hard copy in the space of a year would give the user better, more complete, more repeatable data and would tie up the test sample for a shorter time, there would be no cost saving via the conservative analysis used for the tabulation.

The FSS-250 is actually capable of thousands of spectrum scans per year and accomplishing the equivalent output of numerous manually operated set-ups working simultaneously. With a usage of only 300 scans in the first year the entire investment in the FSS-250 itself is returned. At 1000 scans a saving of $174,500 has been accomplished.

Use of the FSS-250 not only decreases test time many-fold but makes possible statistical evaluation through its capability for repeated re-scan. Also, of vital importance is the considerable time saved through being able to observe a whole octave simultaneously on the CRT Spectrum Display of the FSS-250 and making evaluations before creating hard-copy. An efficient FSS-250 operation, in many cases, will make no recordings until it has been decided through use of this display that the specification limit has been met, and then the X-Y plot is made only for the record.

The additional cost savings from use of the CRT spectrum display feature of the FSS-250 are almost impossible to estimate, but are at a minimum a two-fold improvement over the data on X-Y plots presented in the table.

(over)

ECONOMICS OF FSS-250 USAGE

No. of Spectrum Scans/year:	70	100	200	300	500	1000
Cost of Conventional Testing*	$14,700.	$21,000.	$42,000.	$63,000.	$105,000.	$210,000.
Cost of FSS-250 Testing Consisting of:						
Labor **	1,470.	2,100.	4,200.	6,300.	10,500.	21,000.
Depreciation***	12,000.	12,000.	12,000.	12,000.	12,000.	12,000.
Calibration & Maintenance, etc.	1,230.	1,300.	1,500.	1,800.	2,000.	2,500.
Total	$14,700.	$15,400.	$17,700.	$20,100.	$24,500.	$35,500.
Estimated Annual Cost Saving with FSS-250:	None	5,600.	24,300.	42,900.	80,500	174,500.

NOTES:

* Based on 10 hours/scan involvment by 1 Engineer @ $6.00/hr. and 1 Technician @ $3.50/hr., plus $11.50/hr. Overhead and G&A, for total of $21/hr.

** Based on 1 hour involvment of same personnel as in above. Actual scan consumes as little as 3 minutes; however, remainder of hour is allowed for setup, etc.

*** Based on approximate purchase price of $44,000, including accessories and assuming second year of 5-year life via sum-of-digits method.

FIELD ADJUSTMENTS OF SWEEP BOARD
A3P9 of EMC-10E

February 13, 1968

Bulletin #25

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

Remove top cover of Main Circuit compartment of EMC-10E. Install new sweep board A3P9 in last board position of Main Circuit board compartment of EMC-10E. Turn EMC-10E power switch on. Connect frequency counter (HP-5332A or equivalent) to Cal. output jack of EMC-10E. Advance EMC-10E level control 1/2 CW.

EMC-10E Controls as follows:

Imp. Sel. - 50 ohms
Bandwidth - 5 Hz
Range - Cal.
Selective - Cal.

Freq. -00000
Fine Freq. Controls-Zero
Filter - 500 kHz
Function Sw. - Cal Tracking
Det. Function Sw. - RMS

Step 1. Start frequency adjust (Low end)

Turn on Auto Scan switch, depress start switch and hold. Adjust sweep board pot R14 for a -300 Hz reading on the freq. counter. (The negative frequency area is assured when the counter reading decreases when the pot is turned CCW). If above reading cannot be obtained with R14, remove sweep board and change R12, 15K to (10K, 18K or 22K) until R14 will adjust thru 0 frequency to the negative area.

Step 2. Scan Rate Adjust

Depress start switch and release.

Adjust sweep board pot, R18 until a 25 Hz $\pm$ 3 Hz/sec. scan rate is obtained. Re-start sweep as necessary to complete this step.

Switch bandwidth control to 50 Hz and re-start scan. EMC-10E should scan at 225 Hz $\pm$ 25 Hz/sec. rate.

Switch bandwidth control to 250 Hz and re-start scan. EMC-10E should scan at 1200 Hz $\pm$ 200 Hz/sec.

Step 3. High End Frequency Adjust

Tune EMC-10E to 45 kHz. Depress and hold auto scan start switch, and adjust sweep board pot R23 for approximately 44600 Hz. Recheck Step 2. The sweep board is now adjusted. Replace top cover on the main circuit board compartment, return EMC-10E to housing and return to service.

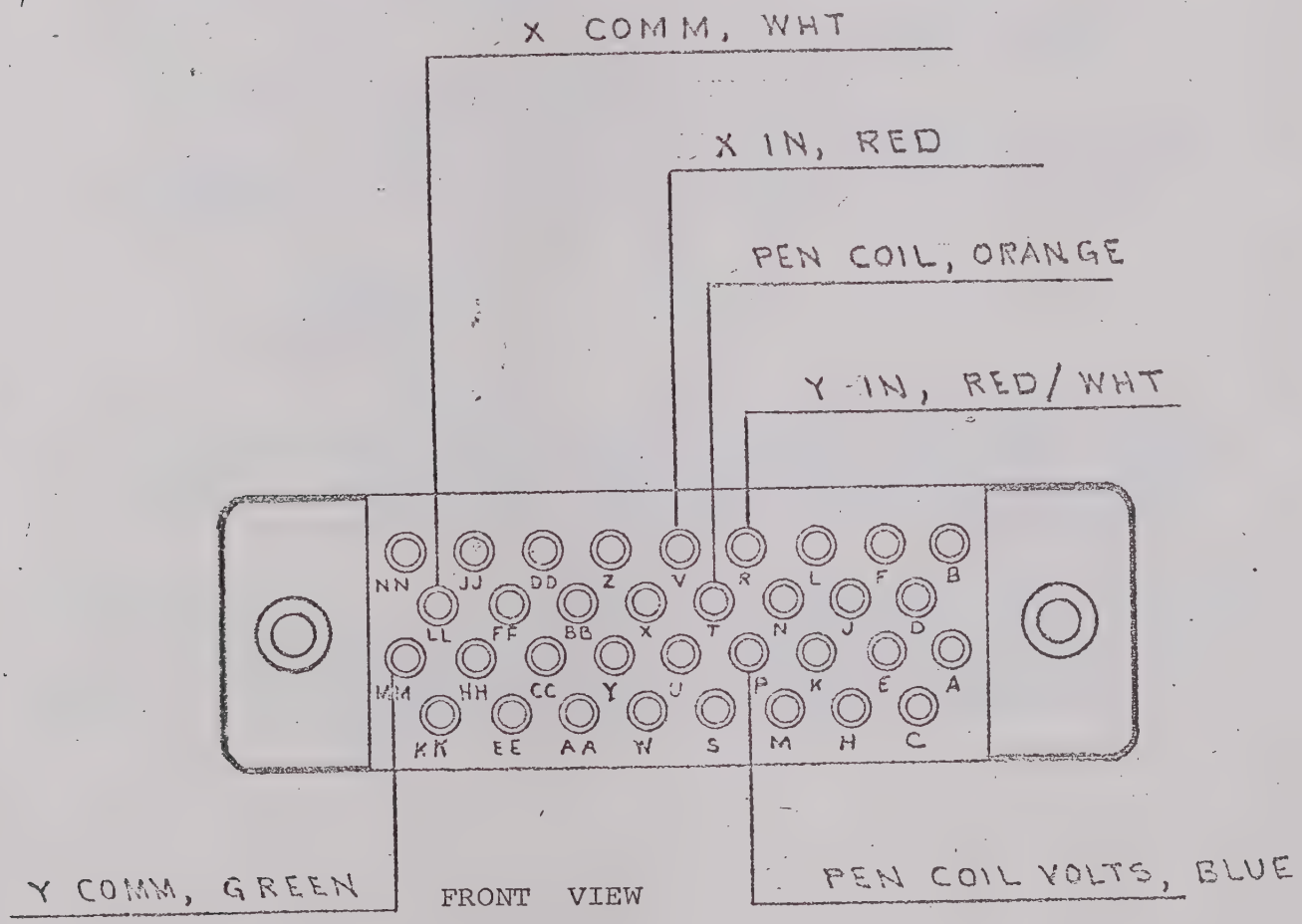
CONNECTOR WIRING FOR
CABLE FROM MODEL ESC-125A
PROGRAMMER TO X-Y PLOTTER

February 6, 1968

Bulletin 26

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN


X COMM, WHT
X IN, RED
PEN COIL, ORANGE
Y IN, RED/WHT
NN JJ DD Z V R L F B
LL FF BB X T N J D
MM HH CC Y U P K E A
KK EE AA W S M H C
Y COMM, GREEN
FRONT VIEW
PEN COIL VOLTS, BLUE

The above diagram depicts wiring of Winchester SRE-34P-JTCH8 connector which mates to receptacle on back of Electro-Scan Programmer Model ESC-125A for connection to an X-Y Plotter. Other end of cable can go to whatever type of connector, fanning strip or plugs are required for the specific type of X-Y plotter or recorder being used. Color-coding need not necessarily be followed.

MAKING CONNECTIONS TO CJB-25

Technical Bulletin #28 A
Obsoleting Technical Bulletin #28
As Issued 3/27/68

July 8, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

1. Connect 34-pin Winchester connector at end of CJB-25 cable to remote jack on EMC-25.

2. Connect antenna control cable (ACC-25) from MS (round) connector to antenna (RVR, RVA, or ALR).

3. To operate the EMC-25 one of the following must be connected to either one of the two 34-pin Winchester connectors on CJB-25:

   A. Dummy Plug
   B. RIM-25
   C. SPD-125
   D. ESC-125A

4. The only time both 34-pin connectors are to be used is when an XYC-25A cable is used in conjunction with a EXY-125A plotter. The other connector must have either the dummy plug or the cable connected to the SPD-125 inserted and locked in place.

NOTE: Owners of the former XYC-25 cables may continue to use them, following the instructions of Technical Information Bulletin #28 or may modify their cables by removing the hood from the connector, and removing all jumpers and the 1.5 K ohm resistor. The cable should then be prominently labelled "A" and the instructions in this bulletin followed.

ADDITIONAL DATA ON INSTALLING
PP-125 IN DUMONT OSCILLOSCOPES

Technical Bulletin #29

March 27, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

To enable operation of oscilloscope 765, 766 or 767 with Electro-Metrics PP-125, as well as "regular" vertical amplifiers, a DPDT switch and bracket should be inserted as follows:

The shielded lead from J-8001, pin 20 (horizontal amplifier)to pin 13 of the CRT should be lifted at the CRT end and connected to the common connection of the DPDT switch section "A".

With the switch mounted in its bracket and thrown to the SPD position, connect the N.O. connection of section "A" to the N.C. connection of section "B" and also connect a shielded lead from this jumper to pin 13 of the CRT.

From the N.C. connection of section "A" connect a shielded lead to J-9001, pin 2, of PP-125 Spectrum Display Unit. From the common connection of section "B" connect a shielded lead to J-9001,pin 18, of Spectrum Display Unit. If the main frame being modified has a Fast Single Sweep -- Normal switch, this switch wiring may be moved to the switch mounted on the bracket for this function with no wiring change.

NOTE: Ground shields where most convenient.
In CSR-200 Manual correct Figure 3.1 to read:
J-9001 Pin 18 instead of Pin 14.
J-8001 instead of P-8001.
Also indicate leads are shielded.

PROCEDURE FOR INSTALLING
IMPULSE GENERATOR IN EMC-25

Technical Bulletin #30

April 11, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

1. Remove DUMP, SLIDEBACK, METER FUNCTION & BAND SELECT knobs on front panel.
2. Remove 5/8" nut on SERIES OUTPUT jack.
3. Remove six screws that hold front panel in place.
4. Remove bottom cover of EMC-25.
5. Remove battery from unit (4 snap screws). Be sure to unplug AC power if battery plug is removed.
6. Remove turret cover.
7. Unplug power plug to video detector and disconnect the three cables on side of video detector.
8. Disconnect rigid coax cables from rear of I.G. inside turret, and front of I.G. to RF attenuator. Remove this cable completely.
9. Remove panel from unit and set along side of unit. Make sure RF attenuator and coupling shaft are not tampered with during this operation.
10. Remove the five flathead screws from rear of I.G. inside turret.
11. Install new I.G. and invert procedure.
12. It may be necessary to recheck the calibration chart for EMC-25 internal calibration.

CALIBRATING EMC-25
WITH STRONG INPUT SIGNAL

Bulletin #31

April 18, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

Isolation in the coaxial switch of the impulse generator in the EMC-25, used to switch between input signal and IG signal, may not be adequate when an extremely strong signal is seen at the instrument input in the high frequency ranges.

Under most conditions, received signals at the high end of the EMC-25 are not of a sufficient magnitude to cause a problem. Under special conditions, however, and in laboratory conditions where an input from a signal generator may be used at a relatively high level, improved isolation may be required.

Under the usual operating conditions of the EMC-25, the input attenuator, which might normally be located at a high level position for a strong signal, is switched to the CAL attenuator position to calibrate the EMC-25 at the specific frequency at which the strong signal is appearing.

The following alternate calibration procedure may be used to overcome the leakage problem:

(1) Turn the INPUT ATTENUATOR fully clockwise to the 100 dB (black) position regardless of frequency.

(2) Press the SHUNT impulse generator push-button and adjust the CAL (IF gain) control to a position 10 dB lower on the front panel meter scale than that called for on the calibration chart and as described in steps 3.7.2(b) and 3.7.3(b) of the instruction manual.

(3) The instrument will then be calibrated for the specific frequency to which it is tuned.

Some users may find that following this procedure will greatly simplify the calibration of the instrument throughout its entire range and under all conditions.

The above technique is possible because the IG signal is attenuated only 10 dB over that of the "CAL" attenuator position, while the input signal is attenuated up to 80 dB additional.

PROCEDURE FOR REMOVING
FRONT PANEL FROM EMC-25

Technical Bulletin #32

April 24, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
88 CHURCH STREET • AMSTERDAM, N. Y. 12011

TECHNICAL INFORMATION BULLETIN

1. Remove DUMP, SLIDEBACK, METER FUNCTION & BAND SELECT knobs on front panel.
2. Remove 5/8" nut on SERIES OUTPUT jack.
3. Remove six screws that hold front panel in place.
4. Remove bottom cover of EMC-25.
5. Unplug power plug to video detector and disconnect the three cables on side of video detector.
6. Disconnect rigid coax cables (front of I.G. to RF attenuator). Remove this cable completely.
7. Remove panel from unit. Make sure RF attenuator and coupling shaft are not tampered with during this operation.

TEST PROCEDURE RVA-25

Technical Bulletin 33

May 13, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

TANGENTIAL SENSITIVITY

The following procedure is used to determine tangential sensitivity of the Remote Active Vertical Antenna Model RVA-25:

1. Remove dummy plug from EMC-25 and connect RVA-25 power cable.

2. Connect 25-foot RF cable "Sig. Out" on RVA-25 to "RF Input" on EMC-25.

3. EMC-25 front panel settings:

A.	RF Attenuator:	CAL position
B.	Bandwidth:	WIDE
C.	Audio:	CCW
D.	Dump:	CCW
E.	Slideback:	CCW
F.	Meter Function Switch:	Peak position
G.	Freq. Control:	To freq. desired.
H.	Tuning Mode:	Manual
I.	AFC:	OFF (Down)

4. Depress series CAL button on EMC-25 and set CAL control to some reference on EMC-25 meter (Noise).

5. Connect external IG (Empire Model IG-115 or equivalent) to "CAL IN" on RVA-25.

6. Adjust external IG output level until a "3 dB" rise above noise level is noted on the EMC-25 meter. This level is the broadband tangential sensitivity at the selected frequency.

7. For worst case sensitivities see Figure 3-2 in the RVA-25 instruction manual.

MULTI-BAND GRAPHS

Bulletin #34

May 22, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

Attached are copies of standard multi-band paper on which is indicated the specification limits for various methods under MIL-STD-826. These have been laid our for use either with the EMC-25R and programmer, or with a complete FSS-250 system, and indicate the various settings of the instrument and the type of antenna to be used. They were provided by one of our customers.

The main dark line on each block indicates the combination of the specification limit and the antenna factor. By using a graph of this type, a single run-through of the frequency range of 14 kHz to 1 GHz can be made, culminating in a direct reading which indicates in or out of the specification limit.

Date_____ Page_____

Test Specimen_____

Operation Mode_____

MIL-STD-826
Method 4001
Scan Speed 1 min/band
Bandwidth - Broadband

Test Notes:

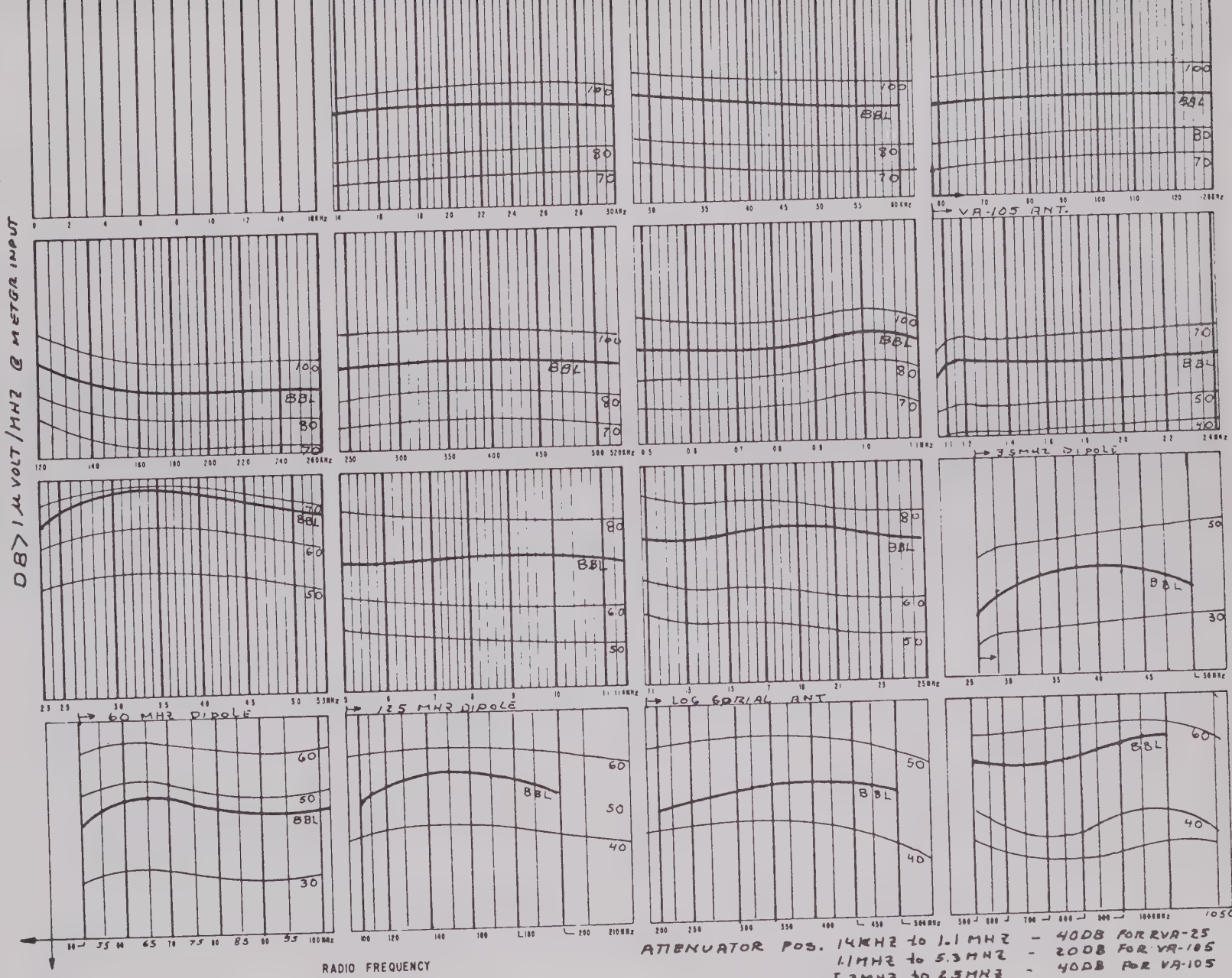
Test Equipment
EMC-25 S/N 94

Antennas:
RVA-25
VA-105
BDA-25
CPL-1A

Conducted By_____

Ref. Log Book_____

Page_____



BBL - EQUIV. METER READING FOR MIL-STD-826 BROAD BAND RADIATED INTERFERENCE

ATTENUATOR POS. 14KHZ to 1.1 MHZ - 40DB FOR RVA-25
1.1MHZ to 5.3MHZ - 20DB FOR VA-105
5.3MHZ to 25MHZ - 40DB FOR VA-105
25MHZ to 1000 MHZ - 40DB (RED Scale)
NOTE: USE 10 DB ATT. IN SERIES WITH COAX cable from LOG SPIRAL ANT. (200 MHZ to 1000 MHZ)

Date_____ Page_____

Test Specimen_____

Operation Mode_____

MIL-STD-826
Method 4001
Scan Speed 1 min/band
Bandwidth - Narrowband

Test Notes:

Test Equipment
EMC-25 S/N 94

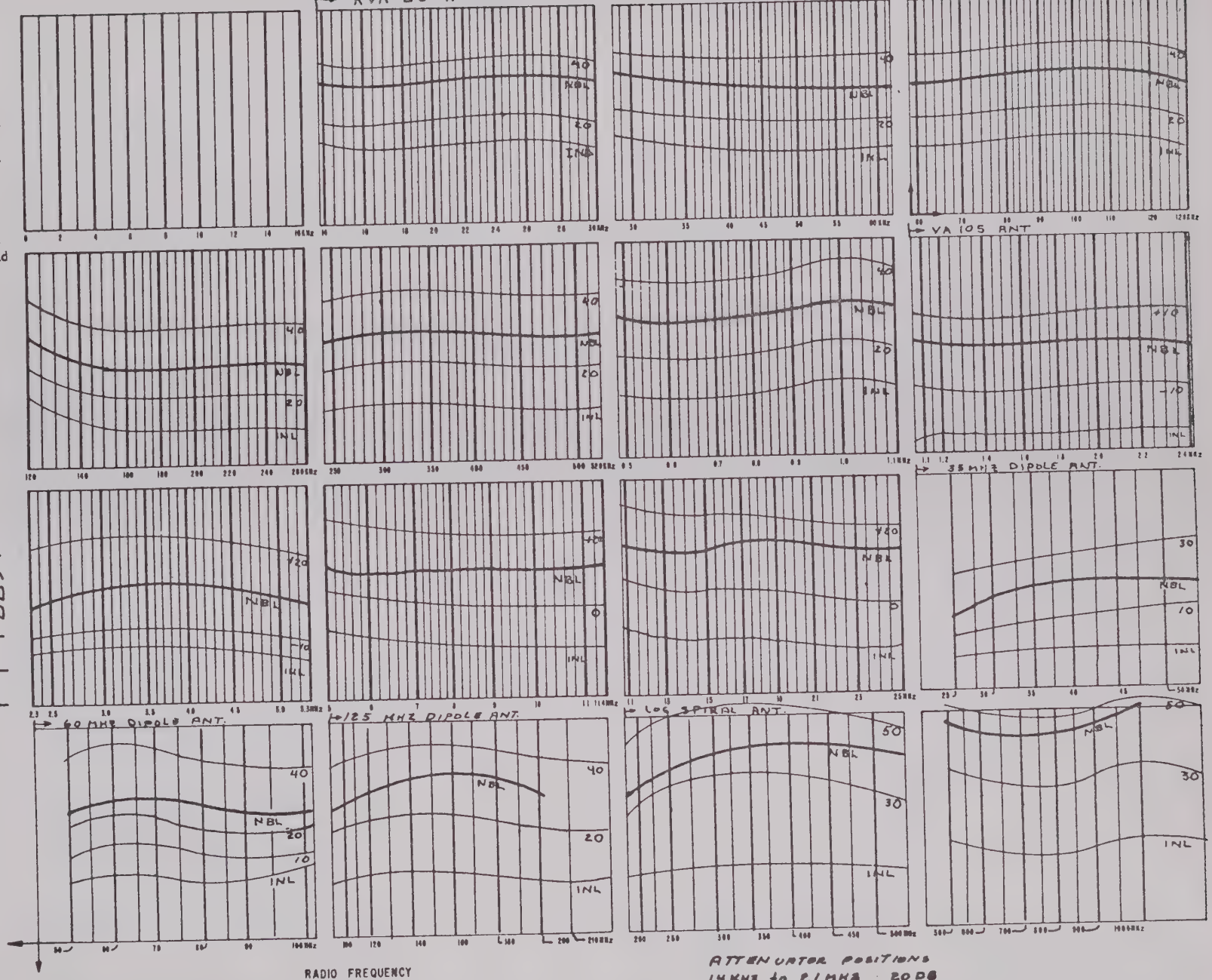
Antennas:
RVA-25
VA-105
BDA-25
CPL-1A

Conducted By_____

Ref. Log Book_____

Page_____

DB > 1 MICROVOLT @ METER INPUT



RADIO FREQUENCY

NBL = EQUIV. METER READING FOR MIL-STD-826 NARROWBAND RADIATED INTERFERENCE LIMITS

ATTENUATOR POSITIONS
14 KHZ to 2.1 MHZ 20 DB
2.1 MHZ to 1 GHZ 0 DB (BLK SCALE)

Date_____ Page_____

Test Specimen_____

Operation Mode_____

Cable_____

or

Line_____

MIL-STD-826
Method 3001 & 3002
Scan Speed 1 min/band
Bandwidth - N. B.

Test Notes:

Test Equipment
EMC-25 S/N 94

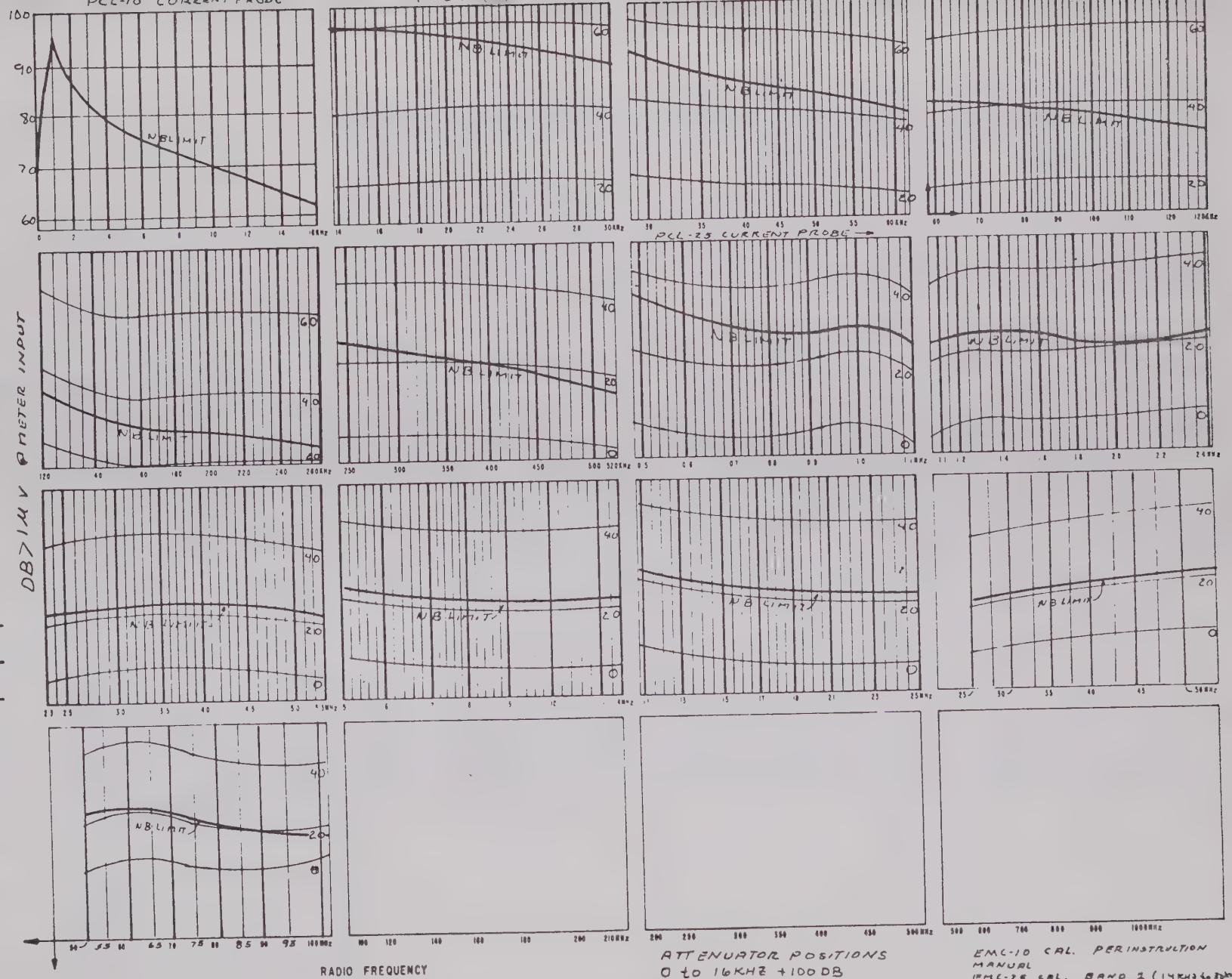
Probes:

PCL-10 S/N 198
91197-1
S/N 66BG-004
PCL-25 S/N 94

Conducted By_____

Ref. Log Book_____

Page_____



LIMIT LINE - EQUIV METER READING FOR MIL-STD-826 NARROW BAND CONDUCTED INTERFERENCE LIMITS

ATTENUATOR POSITIONS
0 to 16KHZ +100DB
14KHZ TO 260 KHZ 40DB
260KHZ to 25MHZ 20DB
25MHZ to 1GHZ 20DB (0 DB BLK SCALE)

EMC-10 CAL. PER INSTRUCTION MANUAL
EMC-25 CAL. BAND 1 (14KHZ to 260KHZ) SET DIAL AT 22KHZ, CAL, ADJ. CAL GAIN TO 0 DB METER PER INSTRUCTION MANUAL

Date_____ Page_____

Test Specimen_____

Operation Mode_____

Cable_____

or

Line_____

MIL-STD-826
Method 3002
Scan Speed /Min/Band
Bandwidth-Wide

Test Notes:

Test Equipment
EMC-25 S/N 94

Probes:

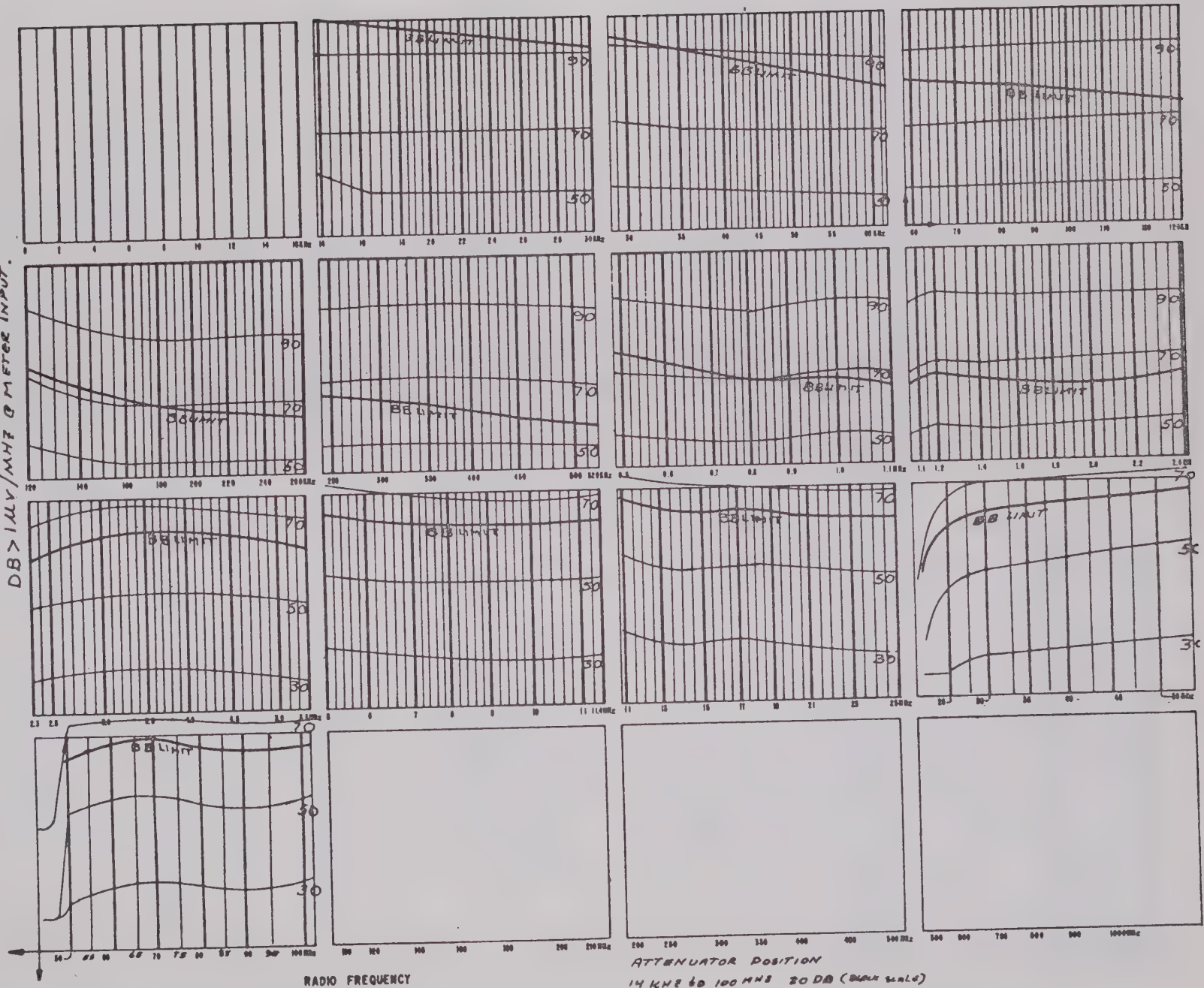
14 KHz - 520 KHz
91197-1
S/N 66BG-004

.5 MHz - 100 MHz
PCL-25
S/N 94

Conducted By_____

Ref. Log Book_____

Page_____



BB LIMIT IS EQUIV. METER READING FOR

ATTENUATOR POSITION
14 KHz to 100 MHz 20 DB (BLACK KNOB)
EMC-25 CAL. BAND 1 (14 KHz to 30 KHz)

OPERATING INSTRUCTIONS
CALIBRATOR LEVEL CONTROL
MODEL CLC-25

Bulletin #35A

October 30, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

The CLC-25 is used to obtain a calibrated level in dBuV/MHz for the EMC-25 Impulse Generator. The CLC-25 and EMC-25 may be used in any procedure where a calibrated impulse generator is needed. Depressing the SERIES CAL button (EMC-25) will produce an impulse signal at the IG OUTPUT connector on the EMC-25 front panel. The three-position toggle switch controls whether positive or negative impulses will be produced or the CLC-25 placed in the standby position (OFF).

Electrical connections are as follows:

The 34-pin connector at the end of the multi-conductor cable should always be connected directly to the remote 34-pin connector of the EMC-25. Either the dummy plug or the Model CJB-25 Junction Box must be connected to the CLC-25 rear panel 34-pin connector. The 12" cable supplied with the CLC-25 is used to connect the IG OUTPUT to the RF INPUT on the EMC-25.

Operation of the CLC-25:

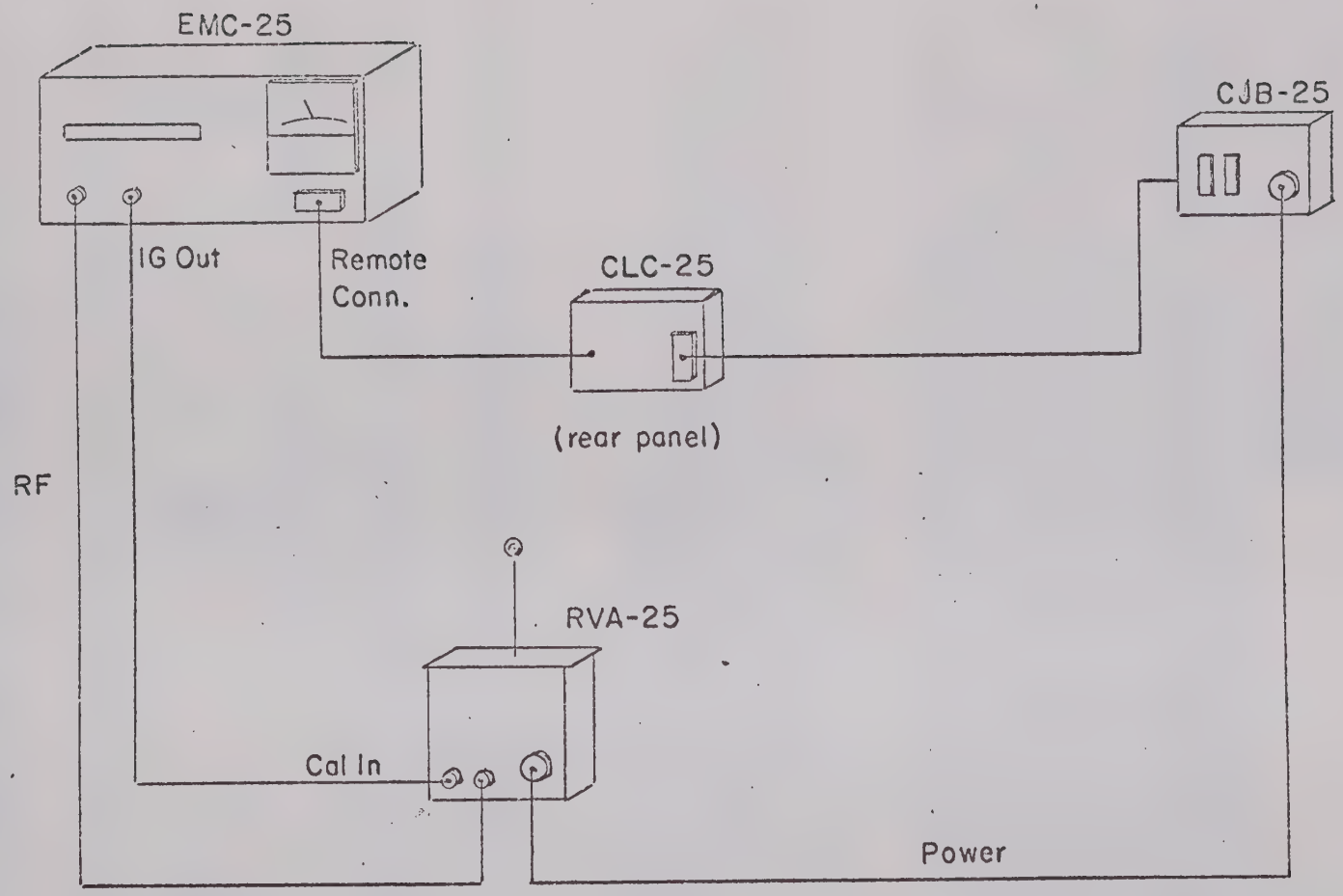
The CLC-25 is calibrated in 1 dBuV/MHz steps from -15 to +85 and may be used in either a positive or negative polarity. To obtain an impulse signal of a given level:

(1) Set the 1 dB and 10 dB selectors to algebraically add to that value. Several examples are shown below.

To obtain	10 dB Selector	1 dB Selector
-11 dBuV/MHz	-10	-1
+ 3 dBuV/MHz	0	+3
+37 dBuV/MHz	+40	-3
+75 dBuV/MHz	+70	+5

(2) Set the polarity switch as required. Either polarity normally may be used.

(3) Depress the SERIES CAL button. An impulse level of the amplitude desired will appear at the "IG Output" connector on the EMC-25 front panel



Typical CLC-25 interconnection

TRUE ANTENNA FACTOR FOR
LOG CONICAL ANTENNA MODEL LCA-25

Bulletin #36A

(Bulletin #36 July 15, 1968)

February 24, 1969

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

We indicated in our Technical Information Bulletin dated July 15, 1968 that the Air Force requires that a factor, constant over the frequency range, of 12.5 dB is to be used with MIL-STD-826A radiated measurement tests over the frequency range of 200 MHz to 1000 MHz when using the LCA-25.

This requirement is no longer in effect, and in fact, Mr. Charles Seth of the Air Force at Wright-Patterson Air Force Base has informed us that the 12.5 dB factor is no longer to be used. He has indicated that the true antenna factor for the Log Conical Antenna LCA-25 is to be used.

The true antenna factor is provided with each Log Conical Antenna Model LCA-25. For any owner of the LCA-25 who does not have a true antenna factor for that specific antenna, he may make use of the typical antenna factor as shown in Figure 3, Page 29 of MIL-STD-461A and be assured that it will be within 1 to 2 dB of his actual factor.

ANTENNA-INDUCED VOLTAGE
FOR EMC-25 41" ROD ANTENNA

Bulletin #37A

August 21, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

The antenna factors which are shown in our various antenna manuals are in terms of microvolts per meter for actual field intensity. This is the number of microvolts which would be induced in an open-circuit antenna with an electrical length of one meter.

If a specification calls for measurement in terms of antenna-induced open circuit voltages, it is necessary to subtract 6 dB for our given antenna factor for the RVR-25 rod antenna. This is done because the effective electrical length of our 41" rod is one-half meter.

According to the note on page 2-33 of the latest instruction manual for the Singer Model NF-105 the dB factor for their 41" rod antenna is given in terms of antenna-induced open circuit voltages. And to obtain field intensity it is necessary to add 6 dB.

As a result of this difference in presentation of antenna factors, it may appear that our antennas are 6 dB less sensitive than those manufactured by Singer. A comparison shows, however, that when 6 dB is added to the Singer dB factors to convert them to field intensity, the same as our antenna factors, that their antennas are no more sensitive than ours and in some cases are less so.

We actually show better sensitivity in the frequency range of 14 kHz to 25 MHz because of having more bands in this frequency range than has the NF-105, making it possible for us to tailor our matching transformers in the antenna base more closely to the 50-ohm impedance match required.

AUDIO IMPROVEMENTS
FOR EMC-25

Bulletin #38

July 17, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

The following modifications are for improving the audio performance of the EMC-25:

(1) To improve linearity of audio control install 10K ohm ¼W 10% resistor in series with +12V to audio pot (red wire).

(2) To reduce audio distortion replace R6,470 ohm ¼W 10% resistor on audio board with 10K ohm ¼W 10% resistor.

(3) To reduce audio oscillations replace blue wire from Pin 9 of sweep tune board to Pin 1 of A1FL1 (bulkhead filter) with shielded cable grounding one side of shield to Pin 11 of audio board and ground other side on ground lug near bulkhead filter. NOTE: See Technical Bulletin #32 for panel removal. Audio board is located directly behind front panel meter and sweep board is located directly behind audio board (has three adjustments on board).

FIELD REALIGNMENT OF EMC-10E
AFTER REGULATOR BOARD REPLACEMENT

Bulletin 39

July 24, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

1. POWER CHECK

Remove original Regulator Board located in the rear compartment of the EMC-10E housing, and replace with new regulator board. Remove EMC-10E from housing and insert alignment harness (PEC-10) between the EMC-10E and housing power connector.

Turn on EMC-10E and check -12V at last feed thru (white wire) on filter (A3FL1), located at side of main circuit compartment. Check +12V at next to last feed thru (red wire) on filter (A3FL1) with digital voltmeter. Voltages must be +12V $\pm$ 0.1V or -12V $\pm$ 0.1V.

2. GAIN READJUSTMENT

Set controls:

Gain - To be set

Input Impedance - 10K

Low Pass Filter - 500 kHz

Bandwidth - Wide

Att. Setting - 1 MV

Freq. Control - Above 10 kHz

Output Switch - Cal. Track

Det. Function - RMS

Level Control - CCW

Audio Control - CCW

a. Remove bottom cover from main circuit board compartment.
b. Insert 1 MV RMS 20kHz signal to input of EMC-10E.
c. With Ballantine Probe(Model 314A or equivalent) check voltage at Pin L of preamp board (A3P1). Voltage should be 1 MV.
d. Check voltage at Pin D of preamp board. Voltage should be adjusted with front panel gain control to 100 MV.
e. Check voltage at Pin L of Log. Amp. Board (A3P5) and adjust (R11) on wideband board (A3P4) for 100 MV.
f. Check voltage at Pins B & C of Log Amp. Board. Voltage should be 1V RMS $\pm$ 200 MV.
g. Voltage at Pin L of Det. Driver Board (A3P6) should be adjusted for 1V and/or full scale on EMC-10E meter with R19 (Zero Adjust Pot).

3. METER CIRCUIT REALIGNMENT

Set up meter circuit as stated in Paragraph 4.3.4 in EMC-10 instruction manual.

4. AMPLITUDE CALIBRATOR REALIGNMENT

Set up amplitude calibration as stated in Paragraph 4.3.8 in EMC-10 instruction manual.

5. FREQUENCY ACCURACY REALIGNMENT

Set up frequency accuracy as stated in Paragraph 4.3.7 in EMC-10 instruction manual.

These steps should return the EMC-10E to service condition. Install the EMC-10E in the housing and recheck amplitude and frequency accuracy. The following overall gain chart is provided for use before readjustment of meter circuit, frequency calibration, and amplitude calibration.

GAIN ADJUSTMENTS (MAIN PATH)

Controls: As in Step 2 Signal Input 1 MV RMS 20 kHz

Step	Item	Location	Procedure
A	Preamp IN	Pin L - (A3P1)	Connect Ballantine Probe and read 1 MV.
B	Preamp OUT	Pin D - (A3P1)	Connect Ballantine Probe and adjust front panel ga control for 100 MV readi
C	Wideband OUT	Pin D - (A3P4)	Connect Probe and adjust R11 for 80 MV reading.
D	Log Amp OUT	Pins B&C (A3P5)	Connect probe and read 1V RMS ± 20 MV
E	Det. Driver OUT	Pin L - (A3P6)	Connect Probe and adjust R19 for 1V RMS and/or full scale on EMC-10E Met
F	TVM Board IN	Pin K - (A4P4)	Same as above.
G	Continue with Step 4, Meter Circuit Realignment		

ADDITIONAL INFORMATION FOR
PROGRAMMER, MODEL ESC - 125A

Bulletin 40

July 24, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

This bulletin should be inserted in the programmer manual with Figure 7.1 for quick reference for J numbers when trouble shooting programmer.

J1)
J2) SWEEP CIRCUIT BOARD
J3)

J4)
J5) COUNTER BOARD
J6)

J7)
J8) STATE DETECT MATRIX BOARD
J9)

J10)
J11) SIGNAL SELECT CIRCUIT BOARD
J12)

J13)
J14) BIAS BOARD
J15)

J16)
J17) POWER SUPPLY REGULATOR BOARD
J18)

J19)
J20) COMPARATOR BOARD
J21)

J22)
J23) BAND DETECT MATRIX BOARD
J24)

J25 EMC-10 POWER CONNECTION

J27 EMC-25 POWER CONNECTION

J28 XY PLOTTER POWER CONNECTION

J29 SU-125 POWER CONNECTION

J30 CONTROL CENTER IN FSS-250 SYSTEM

NOTE 1: All Suffixes represent plug or pin numbers.

EXAMPLE: J30-R or
J20-8

NOTE 2: Refer to Fig. 4.3 for J1 thru J24 and Fig. 3.2 for J25 thru 30.

LOCATING EMC-10
ALIGNMENT PROCEDURES

Bulletin #41

August 1, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

Making a circuit board exchange to fix a problem is usually relatively easy, but finding the proper procedure for re-alignment is sometimes more difficult. To help with such changes in the EMC-10, there is provided below a guide to locating the procedure to be followed when exchanging any one of its major components.

Part No.	Part Description	Check and/or Align to Tech. Bulletin #	Check and/or Align to EMC-10 Manual Paragraph #
2300	Charger	No alignment required	
BAT-10	Battery	No alignment required	
A5P5	Reg. Board	#39	4.3.2
A3P1	Preamp Board		4.3.5, 4.3.6
A3P2	1st. I.F. Board		4.3.6
A3P3	2nd I.F. Board		4.3.6
A3P4	Wideband Board		4.3.5
A3P5	Log Board	No alignment required	
A3P6	Driver Board		4.3.4
A3P7	Dummy AFC Board	No alignment required	
A3P8	VCO Board		4.3.7
A4P7	Cal Tracking Osc. & BFO Board		4.3.8
A4P6	Mixer Board		4.3.8
A4P5	Audio Board		3
A4P4	TVM Board		4.3.4
A2BM1	Balanced Modulator		4.7.3
A2EF1	Emitter Follower		4.7.4
A3P9	Sweep Board (option)	#25	4.3.3

NOTE: After making board change and before applying power, check -12V and +12V lines for resistance to ground.

If Part # in left-hand column is replaced check alignment or re-align to EMC-10 manual paragraph noted opposite in right-hand column.

1. G. OUTPUT ON FRONT PANEL OF EMC-25

Bulletin # 42

October 22, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

The EMC-25 front panel IG OUTPUT is available as an uncalibrated signal when the SERIES CAL button is pressed. This active output does not interfere with a signal input at the RF connector. If calibration of this series IG OUTPUT is desired, it can be accomplished by two methods:

1.) Using a Fairchild Model CLC-25, which controls and calibrates the IG OUTPUT, it can be varied accurately from -15 dB/μV/MHz to + 85 dB/μV/MHz in 1 dB and 10 dB steps.

2.) Comparing the output to a standard Impulse Generator (such as IG-115) and controlling the level by means of a step attenuator, it can be calibrated. A problem is that the output will be of one amplitude when the EMC-25 is in Band 1-7, another amplitude for Bands 8-10 and still another amplitude for Bands 11-15. The highest level will be present when in Bands 1-7.

FSS-250 INSPECTION TEST

November 6, 1968

Bulletin #43A

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

CONFORMANCE CHECK-OUT PROCEDURE FOR INCOMING INSPECTION OF SPECTRUM SURVEILLANCE SYSTEM MODELS FSS-250 and FSS-250D

1.0 Turn on power and check voltages on meter panel.

2.0 PROCEDURE FOR SETTING UP EMC-10

2.1 Set controls as follows:

IMPEDANCE - 50 ohms
WIDE BAND ATT. - CAL
NARROW BAND ATT. - CAL
FILTER - 50 kHz
BANDWIDTH - WIDE BAND
FREQUENCY - 1 kHz
FUNCTION SWITCH - CAL TRACKING
LEVEL - CCW
METER SELECT - CARR
AUDIO - CCW

2.2 Adjust gain on EMC-10 for F/S and check bandwidth positions. Should be within $\pm$ 1 dB of each other.

2.3 Switch wide and narrow band attenuator to 100 uV position.

2.4 Set bandwidth switch to 5 Hz position.

2.5 Set frequency to 00000 Hz.

2.6 $\triangle$ f to 0 Hz.

2.7 Programmer setting - MAN, all band switches up. Press START then STOP. EMC-10 light (0-14 kHz) should be ON.

2.8 Zero adjust for peak on EMC-10 meter.

2.9 EMC-10 is now calibrated for frequency (X) and amplitude (Y).

3.0 PROCEDURE FOR SETTING UP EMC-25R

3.1 Attenuation - CAL (20 dB BLK)

3.2 Frequency - Approximately mid-way

3.3 Fine tuning - Mech. center

3.4 AFC-MAN-SWP - switch - MAN

3.5 Tuning aid - OFF (Down)

3.6 Dump - OFF (Max. CCW)

3.7 Slideback - MAX CCW

3.8 Bandwidth - WIDE

3.9 CAL - Approximately 1/3 CW from CCW

3.10 Meter select - PEAK

3.11 Audio - CCW

4.0 PROCEDURE FOR SETTING UP CONTROL CENTER

If dual pen (FSS-250D)

4.1 Pen # 1 - switch to normal

4.2 Pen # 2 - switch to OFF

4.3 Frequency control to ESC

4.4 CAL Level controls to -5 on both controls

4.5 Speaker - OFF

4.6 Deemphasis - OFF

If single pen (FSS-250)

4.7 Recorder switch to normal

5.0 PROCEDURE FOR SETTING UP PLOTTER EXY-125A

5.1 Install multi-band paper (8½" x 11" or 11" x 17")

5.2 Turn on Plotter (on single pen set pen lift to REMOTE and power switch to OPER)

(on dual pen set switches to ON and OPER)

6.0 PROCEDURE FOR SETTING UP PROGRAMMER

6.1 All bandswitches up, except "0-14 kHz" switch.

6.2 Sector controls - Lo frequency to "0" and high frequency to "10"

6.3 Press ↑→ button.

6.3.1 Dual pen - adjust gain controls (X, Pen 1 and Pen 2) so Pen #2 (right hand pen) is over intersection of ↑→. Pen #1 should be directly behind Pen #2.

6.3.1.1 Press ←↓ and adjust zero controls (X, Pen #1, Pen #2) to correspond to chart paper ←↓.

6.3.1.2 Repeat until no further adjustment is required.

6.3.2 Single pen

6.3.2.1 Press ↑→ button and use the two large black controls marked X and Y under bottom plate on front of plotter to set the pen for intersection of ↑→. (NOTE: It may be necessary to use silver knob next to X coarse to set pen more accurately.)

6.3.2.2 Press ←↓ button and use the two silver knobs on plotter to set pen for intersection ←↓. (NOTE: Silver knob on left for Y and silver knob on extreme right for X.)

7.0 IMPULSE GENERATOR CALIBRATION CHECK:

7.1 Connect standard impulse generator to RF jack for EMC-25 (14 kHz to 1 GHz) at rear panel of system. (Use Singer Model IG 115 or equivalent) Be sure to connect an attenuator in series at IG output. (Recommend using 10 dB attenuator.) If an IG-115 is used, be sure to use the 3 dB correction factor. (EMC-25 is calibrated in terms of the RMS equivalent of the peak value for impulses.)

7.2 Set standard for 60 dB/uV/MHz level at RF jack. If IG-115 is used, set dials on IG-115 to 73 dB/uV/MHz (assuming 10 dB attenuation and 3 dB correction factor.).

7.3 Press SINGLE SCAN button on ESC-125A Programmer.

7.4 Press START on ESC-125A Programmer.

7.5 Adjust SWEEP RATE adjust for relatively fast rate (approximat 20 sec. per band). SWEEP RATE adjustment is located on front of Programmer.

7.6 Let Plotter plot all bands at 60 dB/uV/MHz.

7.7 When completed, remove standard IG and connect short cable from RF to CAL jacks on rear of system (EMC-25, 14 kHz to 1 GHz).

7.8 Press CAL button on front of Programmer.

7.9 Set IG controls on control center to +55 dB/uV/MHz on 10 dB control and +5 dB/uV/MHz on 1 dB control.

7.10 Press START button.

7.11 The Plotter should repeat standard IG line very closely (± 2 dB). If not, adjust CAL level adjustment on front of Programmer until they do.

8.0 BROADBAND SENSITIVITY CHECK:

8.1 Connect jumper coaxial cable from CAL to "RF 14 kHz - 1 GHz" at rear of system.

8.2 Set IG controls on control center to "-5 dB" on "10 dB" switch and "-5 dB" on"1 dB" switch.

8.3 Set EMC-25 controls:

8.3.1 Bandwidth - WB

8.3.2 RF Atten. - "0" dB Pos. Black

8.3.3 CAL control - Approximately 1/3 CW from Max.

8.3.4 C Freq. Control N/A

8.3.5 AFC switch - MAN

8.3.6 Tune aid - OFF (Down)

8.3.7 Detector - PEAK

8.3.8 Dump - CCW (off)

8.3.9 Slideback - CCW

8.3.10 Audio - CCW

8.4 Set ESC-125A controls.

8.4.1 Depress CAL button.

8.4.2 Set switches covering 14 kHz to 1 GHz to UP position.

8.4.3 Press START button. This will draw a line on X-Y Plotter designating noise of the EMC-25.

8.5 When stop light comes on, Set IG controls on control center to "36 db/uV/MHz".

8.5.1 Press START button. Let plotter complete "14 KHz" to "28.5 KHz", Band 1. When ESC-125A switches to "Band 2" press STOP button.

8.6 Set IG Control to "35 db/uV/KHz"

8.6.1 Press START button and let plotter complete "28.5 KHz" to "480 KHz" or Band 5. When ESC-125A switches to "Band 6" press STOP button.

8.7 Set IG Controls to "34 db/uV/MHz".

8.8 Press START button and let plotter complete ".480 MHz" to "2.30 MHz" or Band 7. When ESC-125A switches to "Band 8" press stop button.

8.9 Set IG Controls to "24 db/uV/MHz".

8.10 Press START button and let plotter complete "2.30 MHz" to "25 MHz" or "Band 10". When ESC-125A switches to "Band 11" press STOP button.

8.11 Set IG Controls to "20 db/uV/MHz".

8.12 Press START button and let plotter complete "24 MHz" to "210 MHz" or "Band 13". When ESC-125A switches to "Band 14" press STOP button.

8.13 Set IG Control to "25 db/uV/MHz".

8.14 Press START button and let plotter complete "Band 14," "210 MHz" to "490 MHz". When ESC-125A switches to "Band 15" press STOP button.

8.15 Set IG Control to "32 db/uV/MHz".

8.16 Press START button and let plotter complete Band 15, "490 MHz" to "1 GHz".

8.17 The IG levels just plotted should be easily distinguished above the noise lines previously plotted.

9.0 DYNAMIC RANGE CHECK:

9.1 Follow steps 8.5 to 8.16 except switch RF attenuator on EMC-25 to CAL and increase IG output in 10 dB steps until a total of 40 dB has been plotted for each band and a plot for each 10 dB step has been drawn. These lines should be parallel and no limiting should appear on highest level of impuls Each band should have at least a 40 dB dynamic range. It may be desired to increase levels to each band to determine the limiting or overload level.

10.0 CHECK ON CONVERSION OF BROADBAND LEVELS (dB/uV/MHz) TO NARROW BAND (dB/uVCW):

10.1 Select a plotted impulse level on plotter paper.

10.2 Refer to EMC-25 Instruction Manual CAL charts.

10.3 Note broadband correction at right side of chart.

10.4 Select a frequency or frequencies desired.

10.5 Subtract the number from chart corresponding to the CAL line on chart, from the broadband CAL line on plot. (Example: Broadband CAL line +60 dB/uV/MHz. Correction factor on EMC-25 CAL chart for Band #1 + + 40 dB/uV/MHz. Subtract "+ 40 dB/uV/MHz" from "+ 60 dB/uV/MHz". Answer is "+ 20 dB/uV CW" or "10 uV CW".

10.6 Once the CW levels are computed on plot paper, connect a 50 ohm CW generator at the "RF input 14 kHz to 1 GHz" at rear of system with the desired level and frequency.

10.7 Set function switch on EMC-25 to QUASI PEAK or PEAK position.

10.8 Press SINGLE SCAN or MAN button (MAN if manual tuning is desir

10.9 Press STEP button as many times as necessary to obtain frequen range desired and if SINGLE SCAN is used, let Plotter scan the range and note the pen response to the CW signal. The peak of this response should match the CAL level corresponding to the computed signal level by ± 2 dB.

11.0 FREQUENCY ACCURACY CHECK ON PLOTTER PAPER:

11.1 EMC-25 RF attenuator to CAL position.

11.2 EMC-25 function switch to QUASI.

11.3 EMC-25 AFC switch to MAN.

11.4 Programmer to MAN, STOP and "14 kHz to 25 MHz" switches in up position.

11.5 Connect 50 ohm signal generator with frequency desired to rear of FSS-250 "RF 14 kHz to 1 GHz" jack. Set to 100 uV output level.

11.6 Tune EMC-25 frequency dial until pen on Plotter is over frequency line desired.

11.7 Find frequency with signal generator.

11.8 Assuming generator is accurate, frequency on plot paper should be within ± 3%.

11.9 Bands 11 - 15 (25 MHz to 1 GHz) have to be calibrated by user, since these bands have been hand marked at factory.

12.0 NARROWBAND CW "TANGENTIAL" SENSITIVITY CHECK"

12.1 EMC-25 to N.B., CARR., "0 dB Atten".

12.2 Programmer to MAN, STOP, and switches UP for frequency desired.

12.3 Insert 50 ohm signal generator at "RF 14 kHz to 1 GHz" input at rear of FSS-250.

12.4 Press STEP button to band desired on Programmer.

12.5 Set frequency on EMC-25 dial to frequency desired.

12.6 Tune signal generator to same frequency and adjust output until meter is 3 dB above noise level.

12.7 This level should be at least or better than:

12.7.1 14 kHz to 2.3 MHz - .07uV

12.7.2 2.3 MHz to 11 MHz - .125uV

12.7.3 11 MHz to 25 MHz - .14uV

12.7.4 24 MHz to 49 MHz - .9uV

12.7.5 49 MHz to 98 MHz - 1.1uV

12.7.6 98 MHz to 210 MHz - 1.4uV

12.7.7 210 MHz to 490 MHz - 1.6uV

12.7.8 490 MHz to 1 GHz - 4.0uV

13.0 SPECTRUM DISPLAY MODULE CHECK

13.1 Turn off X-Y Plotter.

13.2 Switch Frequency Control on Control Center to SPD.

13.3 Set Programmer to MAN and 14 kHz to 1 GHz switches UP - step to band desired.

13.4 Set EMC-25 RF attenuator to 40 dB, band width to wideband and meter function switch to CARR.

13.5 Feed 100uV CW signal at approximately center frequency of any EMC-25 Band 1 - 10 and adjust gain to "0" dB on meter.

13.6 Adjust SPD sweep speed to 50 ms/cm, triggering source to "Line" and scope controls adjusted to provide a bright, sharp trace on the scope, with SPD switch in VIDEO and display in LOG position.

13.7 Switch SPD to SPECTRUM.

13.8 Disconnect the cable connected to the PP-125 AM VIDEO input jack and adjust POSITION control of PP-125 until scope trace is positioned at the bottom line of scope graticule. Re-connect the AM VIDEO cable.

13.9 The top of the signal induced response on the scope should now coincide with the "0" dB position on the scope graticule

13.10 Check sweep speeds to be sure speed is not limiting response

13.11 If top of response does not coincide, adjust LOG GAIN until this condition exists.

13.12 Switch to LOCATOR position to be sure "light-up" section responds.

13.13 Check DISPERSION CONTROL and note display.

13.14 Switch to SIGNATURE position and check display for expansion of lighted portion to full display width.

13.15 Switch to VIDEO and check alignment against "0" dB line.

13.16 Check through same procedure in LINEAR position.

13.17 See pages 3-4 through 3-7 of CSR-200 manual for detailed operating instructions.

MAGNETIC FIELD CONVERSION TABLE

Bulletin # 44

November 27, 1968

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

Magnetic Field Conversion Table - Linear Measurement.
Multiply by Conversion Factor.

To Convert From To	Gauss	Pico-Tesla	μ amp /meter (μA/M)	μ Volt/meter (μV/M)
Gauss	--	1.0×10^{-8}	1.26×10^{-8}	3.32×10^{-11}
Pico-Tesla	1.0×10	--	1.26	3.32×10^{-3}
μ amp /meter	$8.0 \times 10^{+7}$	8.0×10^{-1}	--	2.65×10^{-3}
μ Volt/meter	$3.0 \times 10^{+10}$	$3.0 \times 10^{+2}$	$3.77 \times 10^{+2}$	--

Magnetic Field Conversion Table - Logarithmic Measurement.
Add Conversion Factor:

To Convert From To	dBGauss	dB Pico Tesla (dBPT)	dB μ amp /meter (dBμA/M)	dB μ Volt/meter (dBμV/M)
dB Gauss	--	-160 dB	-158 dB	-209.5 dB
dB Pico Tesla	+160 dB	--	+2 dB	-49.5 dB
dB μ amp /meter	+158 dB	-2 dB	--	-51.5 dB
dB μ volt/meter	+209.5 dB	+49.5 dB	+51.5 dB	--

PROTECTION OF CAL LEVEL CONTROL ON
ESC-125A PROGRAMMER

February 19, 1969

Bulletin # 45

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

We have found situations where users of the Electro-Scan Programmer, Model ESC-125A, have inadvertently made adjustments with a screwdriver of the CAL LEVEL Control when they actually meant to make an adjustment of the SCAN Rate.

Because these two controls are near each other on the Programmer front panel, and this mistake is possible, some customers have found it expedient to put their calibration sticker over the CAL LEVEL Control to prevent this mistake from being made. We recommend that this is an ideal place to put the calibration approval sticker. If this is not convenient, almost any type of sticker or label would be appropriate for covering the CAL LEVEL Control.

TYPICAL TUNED DIPOLE INDUCED FACTOR FOR BDA-25 AND LCA-25

Bulletin # 46
(Originally Mrktg.Memo #162)
February 24, 1969

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

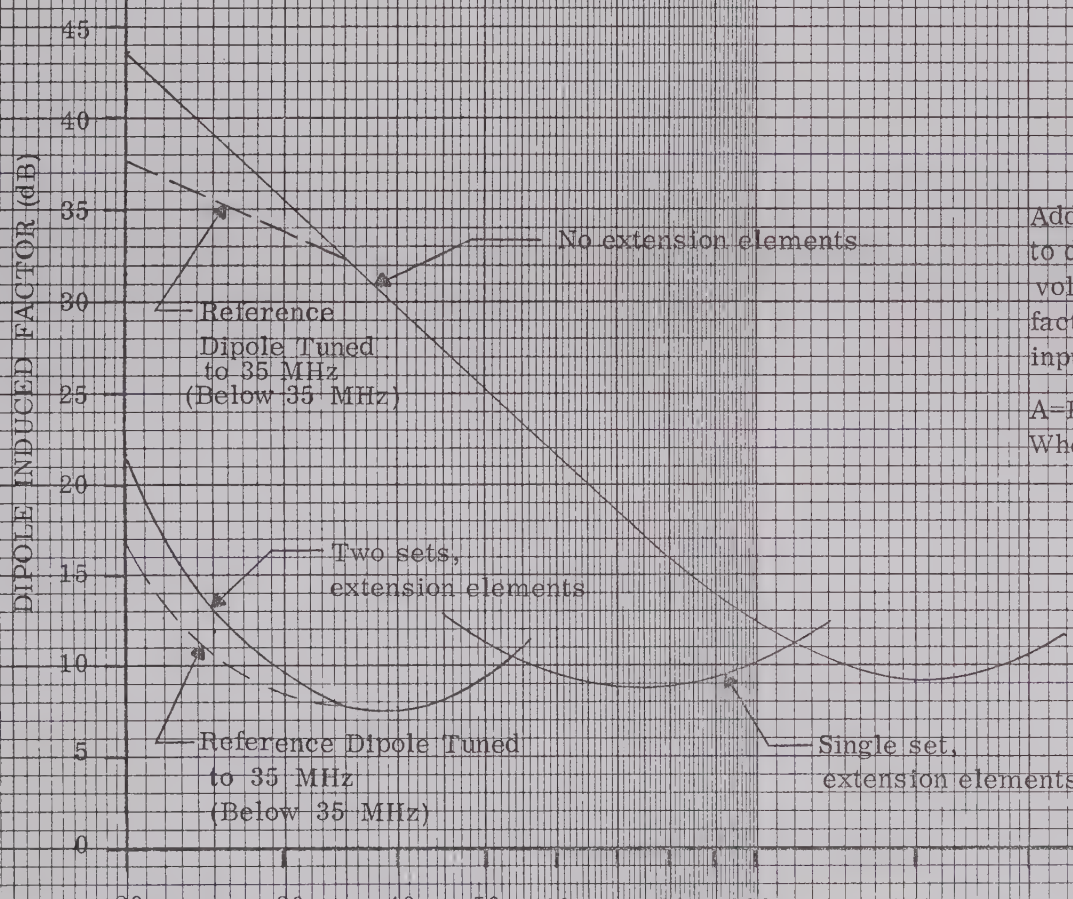
TECHNICAL INFORMATION BULLETIN

Technical Information Bulletin #37A provides antenna induced voltage for the EMC-25 41" rod antenna. It may be also required that the user of the EMC-25 know the typical tuned dipole induced factor for both the Broadband Dipole Model BDA-25 and for the Log Conical Antenna Model LCA-25.

Curves indicating this factor for the various frequencies over which the antennas are used are attached. Descriptive information on these charts indicate the formulas from these factors are derived as well as the use that is to be made of them.

TYPICAL TUNED DIPOLE INDUCED FACTOR

FOR BROADBAND DIPOLE MODEL BDA-25



Add induced factor to receiver input level to determine the equivalent antenna induced voltage of a tuned dipole in dB u V. (This factor includes the insertion loss of the input cable.)

$A = B + 20 \log \frac{\lambda}{\pi}$

Where: A=Dipole Induced Factor in dB.

B=Antenna Factor in dB. (BDA-25)

$\frac{\lambda}{\pi}$ =Effective Height of a tuned dipole. (meters)

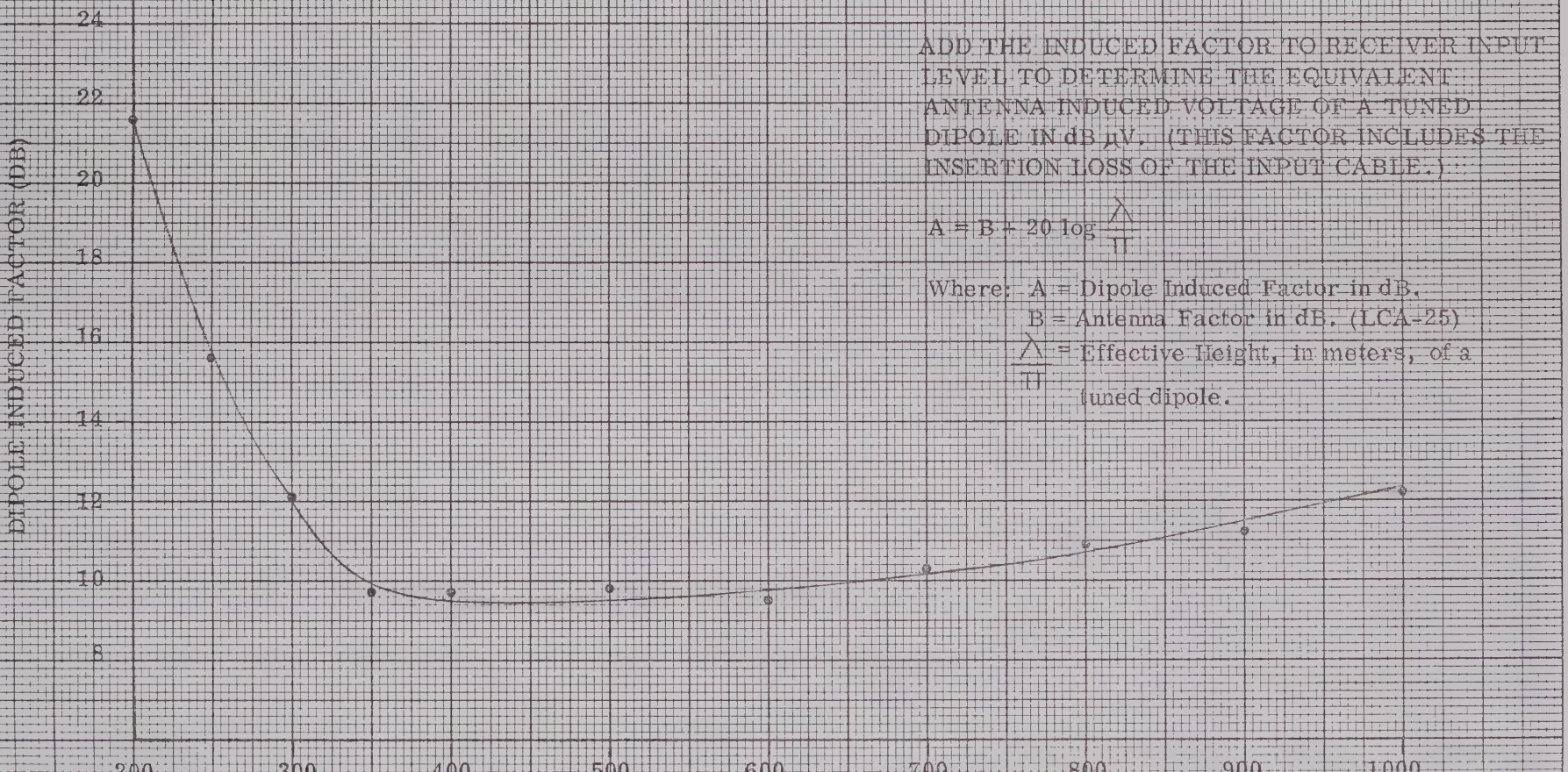
GRAPH PAPER GRAPHIC CONTROLS CORPORATION Buffalo, New York Printed in U. S. A.

SQUARE 10 X 10 TO THE HALF INCH AS-0813-OT

TYPICAL TUNED DIPOLE INDUCED VOLTAGE FACTOR

FOR LOG CONICAL ANTENNA MODEL LCA-25 (Circularly Polarized)

(Add 3 dB For Plane - Polarized Signals)



ADD THE INDUCED FACTOR TO RECEIVER INPUT LEVEL TO DETERMINE THE EQUIVALENT ANTENNA INDUCED VOLTAGE OF A TUNED DIPOLE IN dB μV. (THIS FACTOR INCLUDES THE INSERTION LOSS OF THE INPUT CABLE.)

$$A = B + 20 \log \frac{\lambda}{\pi}$$

Where: A = Dipole Induced Factor in dB.

B = Antenna Factor in dB. (LCA-25)

$\frac{\lambda}{\pi}$ = Effective Height, in meters, of a tuned dipole.

REMOVAL AND REPLACEMENT PROCEDURE
FOR VIDEO DETECTOR No. 2 - EMC-25

March 26, 1969

Bulletin #48A

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

-- Destroy Technical Information Bulletin #48 and Replace with this Bulletin --

REFER: Bulletin #32 -- Procedure for Removing Front Panel from EMC-25

When removal of the front panel has been accomplished, perform the following procedure to effect removal of the video detector no. 2:

1. Disconnect cables numbered 11, 12 and 13 located on left side, and cables numbered 4 and 5 located on right side, of video detector.

2. Assure that all cables and wires are free from the clamps on video chassis.

3. Remove the four (4) screws securing the video detector to the bulkhead and remove video detector.

Replacement of the new video detector is accomplished by reversing the above procedure.

IMPORTANT NOTE

Upon completion of the removal and replacement of video detector no. 2, accomplish the modifications described in Technical Information Bulletin #49A.

MODIFICATION OF LOG DETECTOR - EMC-25

March 26, 1969

Bulletin #49A

FAIRCHILD
ELECTRO-METRICS
CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

-- Destroy Technical Information Bulletin #49 and Replace With This Bulletin --

Refer: Bulletin #48A, Removal and Replacement Procedure for Video Detector No. 2 - EMC-25

Installation of a new video detector No. 2 necessitates the modification of the log detector and is accomplished in the following manner:

1. Remove all external connections to the EMC-25.

2. Carefully place the EMC-25, bottom side up, on a firm flat work surface.

3. Remove 40 screws securing bottom plate to chassis and remove bottom plate.

4. Unplug the A5P5 battery plug.

5. Using a screw driver with, at least, a six inch shaft, loosen the six Dzus fasteners securing the log detector, I.F. amplifier and discriminator to the mounting pads on the EMC-25 housing.

6. Free cables from the cable clamps mounted on the discriminator and carefully lift entire assembly out of the chassis and lay it on chassis.

7. Remove two bracket screws securing the log detector to the assembly and unscrew the seven cables from the log detector.

8. Remove both cover plates from the log detector (32 screws) and accomplish the following:

a. On 175 KC log ---: Replace R48 with a 2.2K 1/4W 10% resistor, replace capacitor C-42 with a 3300pf capacitor.

b. On 1.6 MHz log --: Replace R48 with a 2.2K 1/4W 10% resistor, replace capacitor C-42 with a 330pf capacitor.

c. On 8.7 KC log ---: Replace with a 2.2K 1/4W 10% resistor, eliminate capacitor C-42 and replace capacitor C-47 with a 47pf capacitor.

9. Upon completion of these modifications the log detector must be realigned. Refer to EMC-25 Instruction Manual, Section V, page 5-6, para. 6.

10. Calibration charts must be remade in accordance with page 5-1, paragraph 5.3.3 of the EMC-25 Instruction Manual. Spare calibration charts are included in the manual.

11. For replacement of log detector, reverse steps 1 thru 9.

EXTENDED FREQUENCY RANGE OF EMC-10 IN FSS-250 SYSTEM

June 3, 1970

Bulletin # 51

FAIRCHILD
ELECTRO-METRICS CORPORATION
A SUBSIDIARY OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
100 CHURCH ST., AMSTERDAM, NEW YORK 12010

TECHNICAL INFORMATION BULLETIN

The frequency range of the EMC-10 when used in the FSS-250 System is presently limited to 16 kHz. Since some specifications call for a range out to 20 kHz, a minor modification can be made to the ESC-125A Programmer Sweep Board A6, to extend this range.

Refer to page 7-13/7-14, Figure 7.6 in ESC-125A manual. R-15 is presently a 2.2K ohm resistor. By lowering this value to about a 1.8K ohm and readjusting R-35, 20 kHz may be reached. If it is desired to go to 50 kHz, R-15 can be lowered to a 100 ohm resistor.

www.manualsplus.com
1020944